

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Cancelled)

2. (Previously Presented) The combination of claim 18, the prosthesis further comprising biasing elements that interconnect at least some of the support features, each biasing element urging support features that are interconnected by respective biasing element apart from each other.

3. (Previously Presented) The combination of claim 2, the biasing elements further comprising springs arranged in a generally circular array at the opposed ends of the support, the springs interconnecting adjacent support features to bias the support radially outwardly.

4. (Previously Presented) The combination of claim 3, the support features and the springs of the prosthesis being formed of a continuous length of a resilient material to provide a cage-like support.

5. (Previously Presented) The combination of claim 3, the prosthesis further comprising projections biased to extend radially outwardly from at least one of the opposed ends.

6. (Previously Presented) The combination of claim 5, the projections of the prosthesis further comprising a set of triangular projections interconnected at the opposed ends by biasing elements that orient the triangular projections to extend axially and radially outwardly from the respective opposed ends.

7. (Previously Presented) The combination of claim 18, the prosthesis further comprising a flexible connecting element attached to the support to inhibit radial outward expansion of at least part of the support beyond a predetermined amount.

8. (Previously Presented) The combination of claim 7, the connecting element of the prosthesis further comprising a loop of a flexible cord.

9. (Previously Presented) The combination of claim 7, the prosthesis further comprising a loop of a flexible material connected to the support at each of the opposed ends to inhibit radial outward expansion of the support at the opposed ends beyond a predetermined amount.

10. (Previously Presented) The combination of claim 18, the support of the prosthesis further comprising at least two generally cylindrical support portions having adjacent ends connected substantially coaxially together, the support portions also having respective spaced apart ends that define the axially opposed ends of the support, the valve including an inflow end and an outflow end spaced apart from each other on axially opposed sides of a juncture between the support portions.

11. (Previously Presented) The combination of claim 10, the prosthesis further comprising an intermediate connecting element that connects the support portions at the juncture between the support portions.

12. (Previously Presented) The combination of claim 10, each of the support portions of the prosthesis having a sidewall portion comprising a plurality of elongated support features that extend generally axially between the ends of each respective support portion in a circumferential arrangement, the support features of each support portion being interconnected so as to bias each respective sidewall portion and the valve mounted therein radially outwardly.

13. (Previously Presented) The combination of claim 12, the prosthesis further comprising a plurality of biasing elements that interconnect adjacent support features in each of the support portions, the biasing elements urging the interconnected support features apart from each other to provide radial outward expansion of the respective sidewall portions.

14. (Previously Presented) The combination of claim 13, the biasing elements of the prosthesis being connected by flexible connecting elements in a generally circular arrangement at the ends of each respective support portion, the connecting elements inhibiting radial expansion of at the respective ends of the support portions beyond a predetermined amount.

15. (Previously Presented) The combination of claim 12, the prosthesis further comprising projections biased to extend radially outwardly from the axially opposed ends of the support.

16. (Previously Presented) The combination of claim 15, the projections of the prosthesis further comprising a set of triangular projections connected at each of the opposed ends by biasing elements that bias the triangular projections to extend axially and radially outwardly from the respective opposed ends.

17. (Currently Amended) The combination of claim 18, the prosthesis further comprising an outer sheath of a substantially biocompatible material that covers ~~at least a substantial portion of~~ the exposed parts of the support.

18. (Currently Amended) A heart valve prosthesis in combination with an implanter, the combination comprising:

the heart valve prosthesis comprising:

a generally cylindrical support extending between opposed ends thereof, a plurality of support features extend generally axially between the opposed ends of the support and are interconnected so as to bias the support radially outwardly; and

a pulmonic valve mounted within the support to define a supported valve, the supported valve being deformable between a first condition a second condition, the supported valve having a cross-sectional dimension in the second condition that is less than a cross-sectional dimension of the supported valve when in first condition, whereby implantation of the supported valve is facilitated when in the second condition;

the implanter including an elongated cylindrical enclosure dimensioned and configured to receive the prosthesis when in the second condition; and

the prosthesis being disposed within the cylindrical enclosure, such that an inner sidewall of the cylindrical enclosure maintains the prosthesis in the second condition.

19. (Original) The combination of claim 18, the implanter further comprising a plunger operative to move within the cylindrical enclosure and urge the prosthesis out of the cylindrical enclosure, the support being operative to expand the prosthesis from the second condition to the first condition when discharged from the cylindrical enclosure.

20. (Currently Amended) An implantation system, comprising:
an elongated cylindrical member having spaced apart ends, at least one of the ends providing an opening;

a body portion from which the cylindrical member extends and to terminates in the opening spaced apart from the body portion, the body portion having a different greater outer diameter than the cylindrical member;

a heart valve prosthesis including a generally cylindrical support having axially spaced apart ends, a valve mounted within the support at a fixed axial position between the spaced apart ends of the support, the prosthesis being deformable to a first condition in which the prosthesis has a reduced cross-sectional dimension, the support being biased to expand the prosthesis radially outwardly from the first condition to a second condition in which the prosthesis has a cross-sectional dimension that is greater than reduced cross-sectional dimension, the prosthesis being mounted within the cylindrical member in the first condition; and

a plunger operative traverse at least part of the cylindrical member and urge the prosthesis from the cylindrical member through the opening.

21. (Original) The system of claim 20, the support being formed of a shape memory alloy operative to urge the prosthesis to the second condition.

22. (Original) The system of claim 20, the support further comprising a plurality of elongated support features that extend generally axially between ends of the support, biasing elements interconnecting adjacent support features in a circumscribing relationship around the

valve, the biasing elements urging the interconnected adjacent support features apart from each other, so as to urge the prosthesis toward the second condition.

23. (Original) The system of claim 22, further comprising at least one connecting element operative to hold the biasing elements in a generally circular array and to limit the radial outward expansion of the prosthesis at the location of the circular array.

24. (Original) The system of claim 22, further comprising a plurality of resilient projections that extend radially outwardly from the axially opposed ends of the support.

25. (Original) The system of claim 24, the projections further comprising a set of triangular projections attached to each of the opposed ends of the support by biasing elements that bias the triangular projections to extend axially and radially outwardly from each of the respective opposed ends of the support.

26. (Original) The system of claim 22, the support features and the biasing elements being formed of a continuous length of a substantially resilient and elastic material that facilitates expansion of the prosthesis from the first condition to the second condition.

27. (Currently Amended) The system of claim 20, further comprising an outer sheath of a substantially biocompatible material that covers at least a substantial portion of an the exposed parts of the support.

28. (Currently Amended) The system of claim 20 wherein the valve further comprises an pulmonic animal heart valve having leaflets located within a valve wall to permit substantially unidirectional flow of blood through the valve, the support engaging an outer surface of the valve wall.

29-48 (Cancelled)

49. (Currently Amended) The system of claim 4820, the cylindrical member having an inner diameter in a range from about 5 mm to about 15 mm, and the body portion having a diameter that is greater than that of the cylindrical member.

50. (Currently Amended) An implantation system, comprising:
an elongated cylindrical member having spaced apart ends, at least one of the ends providing an opening;

a body portion from which the cylindrical member extends to terminate in the opening spaced apart from the body portion;

a heart valve prosthesis including a generally cylindrical support having axially spaced apart ends, a valve mounted within the support at a fixed axial position between the spaced apart ends of the support, the prosthesis being deformable to a first condition in which the prosthesis has a reduced cross-sectional dimension, the support being biased to expand the prosthesis radially outwardly from the first condition to a second condition in which the prosthesis has a cross-sectional dimension that greater than reduced cross-sectional dimension, the prosthesis being mounted within the cylindrical member in the first condition;

a plunger operative traverse at least part of the cylindrical member and urge the prosthesis from the cylindrical member through the opening;

a body portion from which the cylindrical member extends and terminates in the opening; and

The system of claim 48, further comprising a handle portion attached to the body portion at a position near a substantially opposite end of the body portion from which the cylindrical member extends.

51. (Currently Amended) The system of claim 4849, the cylindrical member and body portion being substantially coaxial generally linear along a linear axis extending through the implanter's length.

52. (Previously Presented) The system of claim 51, further comprising indicia along an exterior portion of the cylindrical member to facilitate implantation of the heart valve prosthesis.

53. (Currently Amended) The combination of claim 18, the implanter further comprising a body portion from which the cylindrical ~~member~~ enclosure extends and terminates in the open end.

54. (Currently Amended) The combination of claim 53, the cylindrical ~~member~~ enclosure of the implanter having an inner diameter in a range from about 5 mm to about 15 mm, and the body portion having a diameter that is greater than that of the cylindrical enclosure.

55. (Currently Amended) The combination of claim 53, the implanter further comprising a handle portion attached to the body portion at a substantially opposite end from which the cylindrical ~~member~~ enclosure extends.

56. (Currently Amended) The combination of claim 53, the cylindrical ~~member~~ enclosure and body portion of the implanter being substantially coaxial generally linear along its length a linear axis extending through the implanter.

57. (Currently Amended) The combination of claim 56, the implanter further comprising indicia along an exterior portion of the cylindrical ~~member~~ enclosure to facilitate implantation of the heart valve prosthesis.

58-59. (Cancelled)

60. (Currently Amended) The implantation system of claim 50-59, the heart valve ~~means~~ further comprising a natural tissue pulmonic animal heart valve.